

OWNER'S MANUAL



LOWREY ORGAN

Contents

To get the most from your Lowrey, to fully enjoy its great musical possibilities, we sincerely urge you to read this manual carefully. Certain sections will warrant re-reading several times as your musical ability increases. The time you spend will repay you a hundred-fold in additional pleasure, enjoyment and satisfaction.

A story of the past

Well over two thousand years ago the first organ pipes were developed. Through the centuries the organ grew in versatility—but it also grew in size, in weight and in cost. By the end of the 19th century some organs had as many as six—and even seven keyboards (manuals).

Not many years ago, only a few of the wealthiest families were able to build a small organ into their homes. It was not until recent years that a spinet organ was available for the home. But thanks to modern science, you now have a spinet organ. This truly remarkable electronic instrument has solved the three problems of enormous cost, excessive space required and tremendous weight.

A few words about the Lowrey organ

Since 1894, Lowrey has spent many pioneering years in research and development of fine organ tone. Some work was done as early as 1910 and, beginning in 1918, a great deal of research went into several types of electric generators. With the advent of the electronic vacuum tube, Lowrey began in 1928 to develop what later became known as an "electronic" organ.

Through the 1930's and 1940's many different generating systems were developed, some of them which are now being used by other companies. These were all abandoned by Lowrey in favor of the new "Eccles-Jordan" circuit, which today is the most advanced and stable circuit in the industry. Thus, your Lowrey is different than any other organ in that it starts with the odd harmonics of a clarinet tone, and as a result can produce not only good reed tones but also clear, clean flute tones and fine string tones, rich in harmonics.

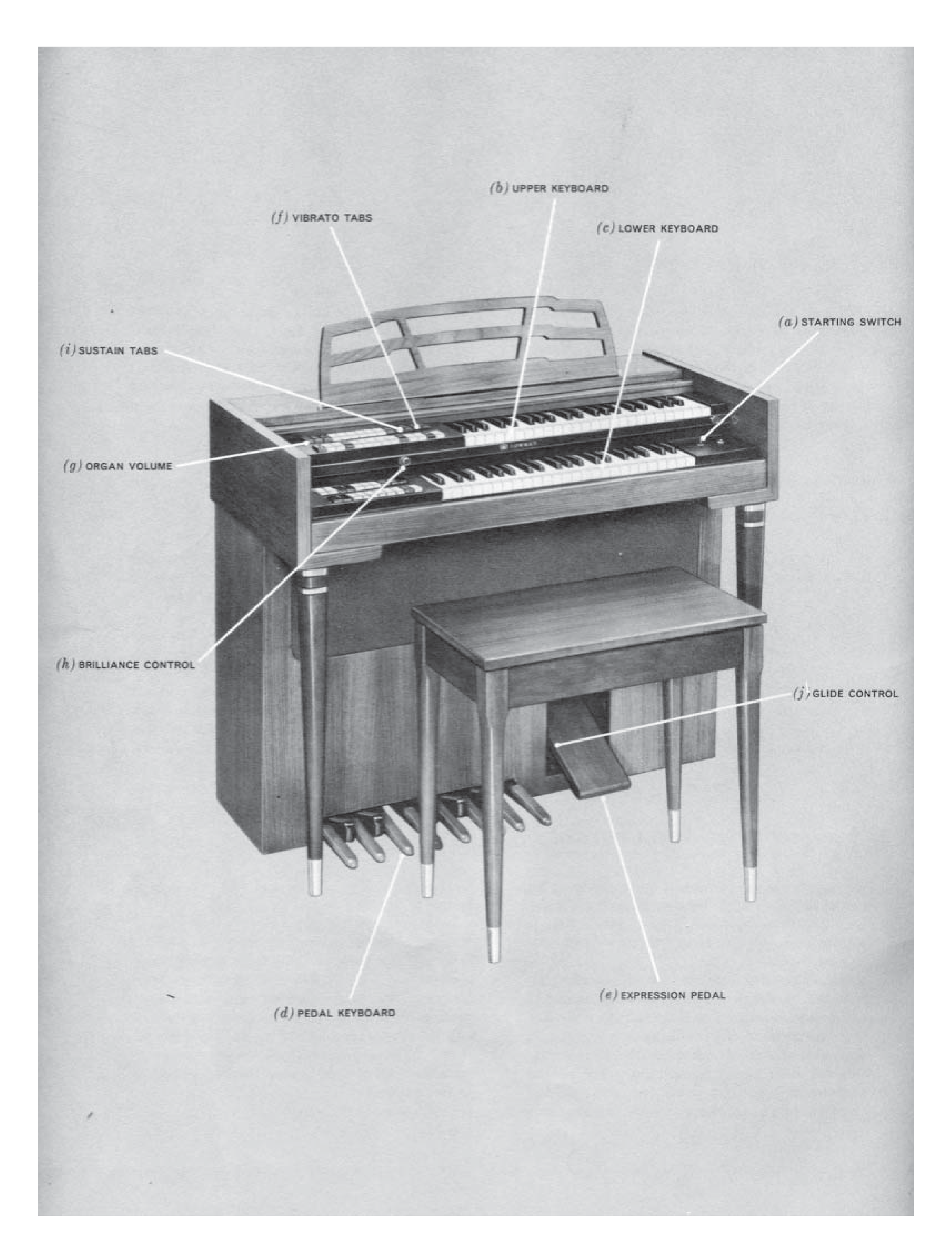
The Lowrey was not an "over-night" discovery. The many pioneering years spent in organ research and development have resulted in the creation, design and manufacture of a high quality, dependable organ which is considered as an outstanding achievement.

Are you artist, amateur or beginner?

If you have had experience with an acceptable organ, you will be familiar with the strange words of "stops" — "footages" — "solo" — "sustain," etc. Thus, you will *instantly* feel very much "at home" with your Lowrey Heritage.

If you have had experience with a keyboard instrument but not with the organ, you will want to read all that follows. The organ is different than other keyboard instruments, since it encompasses practically every field of tone and has a greater dynamic range than any other musical instrument. If you wish to purchase organ music, you will find that there is a vast quantity of Lowrey organ music available from most music dealers. When inquiring about music, be sure to ask for Lowrey organ music.

With the wealth of fine Lowrey organ methods that are available today, everybody can play the Lowrey Organ (even though you have never played a note before). May we also refer you to the exclusive Lowrey "Minit-Music" method—available only to purchasers of the Lowrey Organ. After you are playing your favorite melodies, either with "Minit-Music" or with any other organ method, you will enjoy many countless hours at your Lowrey Heritage with all of its vast resources.



(b) UPPER KEYBOARD
(f) VIBRATO TABS
(c) LOWER KEYBOARD
(a) STARTING SWITCH
(i) SUSTAIN TABS
(g) ORGAN VOLUME
(h) BRILLIANCE CONTROL
(j) GLIDE CONTROL
(e) EXPRESSION PEDAL
(d) PEDAL KEYBOARD

Controls and their operation

Just to make sure you understand the basic parts of your Lowrey Heritage, carefully read each of the following paragraphs with the organ in view. A good knowledge of your instrument and what it can do will assure you of greater ease in playing it, and thus greater satisfaction and enjoyment.

(a) Starting Switch. This "On-Off Switch" to the right of the lower keyboard controls the entire organ. It will "warm up" in about fifteen seconds, but a few seconds additional time may be required for the vibrato section to take effect.

(b) Upper Keyboard. This is the Upper or "Swell Manual." Generally, it is played with the right hand, but many times it is played with both hands or just the left hand alone. The stop tabs in the top two rows control the tones for this Upper Manual and they may be played singly or in any combination. They are called "Stops" because they stop the particular voice when the tab is in the "Off" position. That is, when they are horizontal. Tilting the tab forward "turns on" that particular voice. Notice how easy it is to quickly select the voice or voices you desire.

(c) Lower Keyboard. This is known as the Lower or "Great Manual." Although the left hand is generally used on this manual, there are many occasions when both hands are used or just the right hand alone. The stops which affect the lower Manual are in the lower tab control assembly.

(d) Pedal Keyboard. Note that you have a *full* octave of thirteen pedal keys, the equivalent of 16′ and 8′ pipes, from C through C an octave above. The tones from these pedal keys add a rhythm, or in faster or popular music, a "beat." Thus, as in an orchestra, while the pedals keep a rhythm, one hand can play the melody and the other hand can add an accompaniment. As you listen to an orchestra, generally you will hear these three "levels" of music.

(e) Expression Pedal. As with all organs and unlike the piano, there is no way to control volume or get "expression" from the keyboard. Therefore, the Expression Pedal, operated by the right foot, permits you to change the volume from loud to soft—just as a singer varies the volume or his voice or as an orchestra changes the amount of sound it produces.

(f) Vibrato Tabs. These are the three black tabs to the right in the top row. They permit you to add "wavering" effects to all types of music. Their convenient location and ease of operation will enable you to add an amazing variety to your music.

(g) Organ Volume. This tab controls the overall volume of both manuals and the pedalboard. This will be discussed at greater length under the heading of "Mechanical Stops."

(h) Brilliance Control. With this handy control, you can add just the right amount of "highs" to the mellow tones of the organ, giving a rich brilliance to the voices of the particular melody you are playing. This enables you to control the tone to any degree that the acoustics of the room requires as well as for your own musical tastes and personal satisfaction.

(i) Sustain Tabs. The two red Manual Sustain tabs in the upper manual section, as well as the two "Pedal Sustain" tabs in the lower section will be covered completely under the heading of "Mechanical Stops" further in this manual.

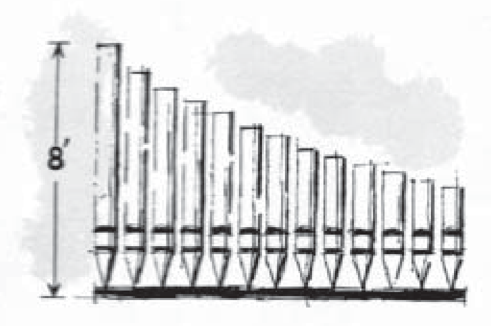
(j) Glide Control. This innovation is exclusive with Lowrey Organs—no other instrument offers this wonderful feature. It helps to complete the illusion of the guitar, trombone, trumpet and strings as they are played in an orchestra. For those who are not too familiar with organ, we suggest that this control, mounted to the left of the Expression Pedal, not be used until some degree of familiarity with the instrument has been developed.

Stop tabs and what they mean



Originally, the word "stop" in a pipe organ referred to a control which "stopped" the wind to a specific group of pipes. Later, it signified a set of pipes for the whole manual, one pipe for each key all of which produced the same tone color. With the developments in the 20th century, organs now have two classes of stops—"speaking" stops which bring forth the actual voices or tones; and "mechanical" stops which by themselves produce no tone but create different effects on the individual speaking stops. If this sounds somewhat confusing we suggest that you reread this paragraph so that you know the difference between the two types of stops.

In this section we will first cover the speaking stops so that you will know something about the history and use of each one. Following this, each of the mechanical stops will be covered in detail.



speaking stops or voices

If you are not familiar with the many stops in the vast field of organ terminology, the subject must appear confusing. However, it is really quite simple. All stops fall into one of four families known as Flute, String, Reed and Diapason. The Diapason tones form the foundation of the organ and all other stops supplement it an combine with it. It is a tone peculiar to the organ in that it has no counterpart in the orchestra. The diapason is not an orchestral voice, but a full, round, and dignified structural stop around which an infinite variety of expression can be built. Flute tones may be described as pure and round, very mellow and with practically no overtones. The opposite are the String tones which have a vibrant, keen quality that in certain voices can be biting or harsh—they often resemble the string instruments in an orchestra. The Reed tones defy description as a group because there are so many varieties. They are "individual" and provide complete contrast to other stops. The reed voices make outstanding solo voices and are extremely effective in the creation of orchestral coloring.

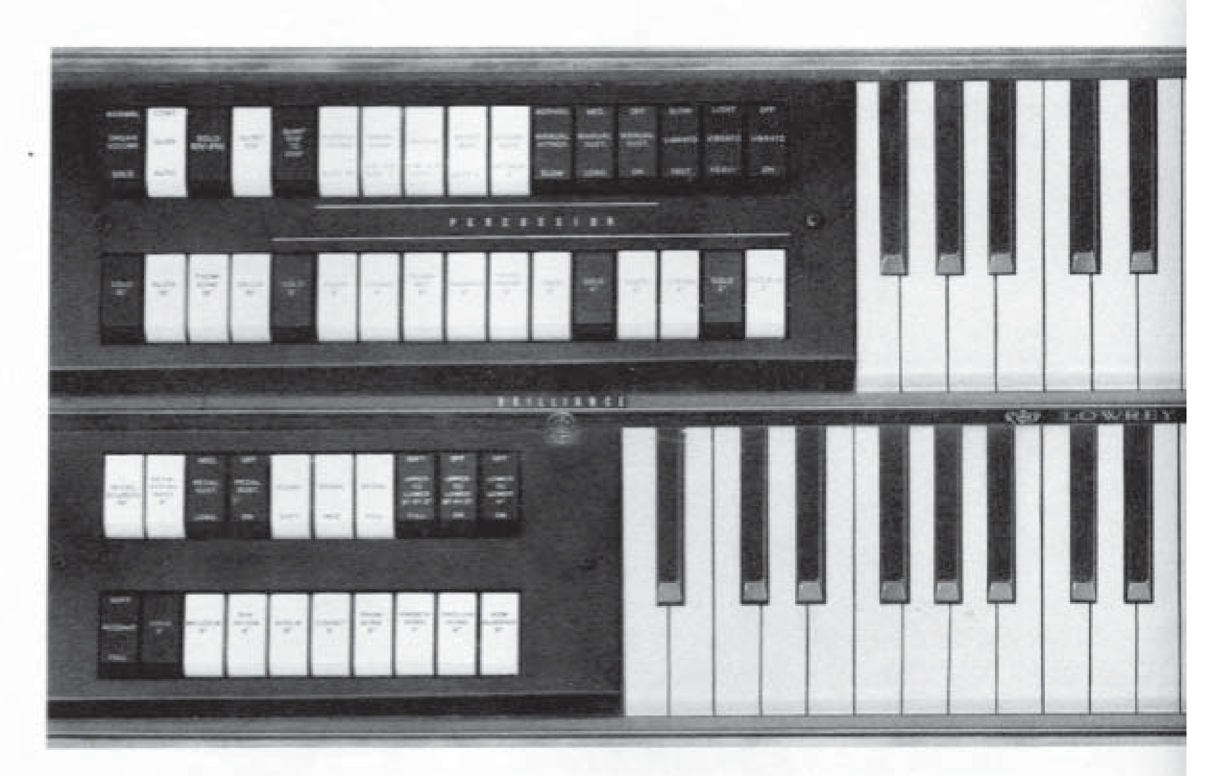
footage

On your Lowrey Heritage each voice is marked with a "footage" designation such as 16′, 8′, 4′, 2′, 5⅓′ and 2⅔′. These are so marked because this is the organist's unit of measure. So you can quickly understand this subject, just consider an 8′ group of pipes as the basic pitch. It is called 8′ because the longest pipe (the bottom C on the manuals) in this group is physically 8′ high in a pipe organ. As we go up the scale, each pipe becomes progressively shorter—however, each pipe in the series is referred to by the actual length of the longest pipe even though the rest of them are smaller. So, although there are no bulky, space-consuming pipes in the modern and versatile Lowrey Heritage, the stops are marked in "footages" for your convenience.

Now, turn on the Flute 8′ on the Upper Manual and play Middle C. Press this key and you will hear the 8′ voice. Holding the same key, if you now add the Flute 4′ you also hear a "tone" exactly one octave higher in pitch. Add the Piccolo 2′ and you will hear a third tone two octaves higher. If you add the Flute 16′ you will hear a fourth tone one octave lower in pitch than the 8′ voice. When you add the Quint 5⅓′ you will hear the G immediately above Middle C. And, by adding the Coupler 2⅔′ you will hear G an octave higher than Quint G. With these six tabs in the "on" position you will hear six tones and in the organist's language, you have "coupled" these six sets of pipes so that every time you press one key you will hear six tones. If you play a chord of four notes you will produce twenty-four tones. This is what gives the organ its full body and richness of tone.

Just remember that 8′ is the basic pitch. The 16′ stops sound one octave lower, the 4′ stops sound one octave higher and the 2′ stops sound two octaves higher. The Quint 5⅓′ plays a fifth above and the Coupler 2⅔′ plays a twelfth above. These will be explained in detail under the discussion of these voices in the next section.

Stop tabs and what they mean



Special Effects • Pre-set Percussion

harpsichord

For this effect use the "Medium" Sustain and no Vibrato. We suggest that you use this voice with the Upper to Lower 8′-4′-2′ coupler so that the voice carries to the Lower Manual—you now have a 88-note keyboard. Play in a completely staccato fashion with both hands and try "18th Century Drawing Room," Paderewski's "Minuet In G," etc. For a more brilliant Harpsichord, try adding the Strings to the Harpsichord pre-set.

vibraharp

This voice is always played with the "Long" Manual Sustain and a Slow-Heavy Vibrato. The technique of the fingers is definitely staccato and can be played in single notes or with chords. However, all notes of the chord should not be struck at once; they should be "rolled" to duplicate the vibraharp which you frequently hear in popular music. When learning the technique you might start with selections such as "Song Of The Islands," "Melody Of Love," "Sleep," etc. For accompaniment on the Lower Manual you can couple the same voice by using the Upper to Lower 8′-4′-2′ coupler, or the Melodia 8′, French Horn 8′ or Viola 8′ from the Lower Manual voices.

guitar

With this voice use the Long Sustain and Slow-Heavy Vibrato—try "Blue Hawaii" or one of the selections mentioned under Vibraharp. Start with single notes. Do not hold the keys. Depending upon the selection and the speed with which it is played, the technique can be staccato or the key can be held for a small

fraction of a second each time. Your own judgment will help you after you listen to guitar music. To complete the sound of the Guitar, use the Lowrey Glide Control on certain notes, pressing the Glide Control with the right foot at the same time you strike certain notes. Do not press the Glide Control for every note played!

This voice can be changed slightly by adding the Clarinet 8′ or the Flute 8′. In fact, a 'steel guitar' effect can be created with just the Flute 8′ and Fast-Heavy Vibrato. To introduce a stringlike quality, add either the 8′ or 4′ String, whichever seems preferable for the selection being played.

music box

This is a soft voice and it generally should be played without the Solo 8′ tab. Use the Long Manual Sustain and no vibrato. As a pure music box, it should be played with both hands in the upper half of the keyboard in an extremely staccato fashion. The Lower Manual and pedal board are not used for this effect. For slightly different voices, add either the Flute 4′ or String 4′.

accordion

This voice duplicates the rich harmonics of the accordion reed and generally is played without Vibrato and with the Manual Attack tab in the "Slow" position. Use single notes or chords and play in a legato fashion. Generally, as each note or chord is played, the Expression Pedal is opened and then retarded rather quickly. Try it with your favorite accordion numbers such as "Peg Of My Heart" or "Twilight Time." An advantage of your Lowrey is that you can add other tabs to this Accordion voice for different effects. For example, in the upper register you might wish to add the Strings. For another quality, add the Flute, Trumpet or Clarinet—or all of them. Note that the addition of the Clarinet adds an "echo chamber" effect, found only on better accordions. By adding the "Medium" Sustain you create the impression of an accordion played in a large hall or auditorium. For a deep voice in the lower register use the Cello singly or in combination with the above tabs. As with all these pre-sets, experiment and try different combinations to find those which best fit your mood, the way you play and the effects you wish to create.

chimes (all swell 8′, 4′ and 2′ voices)

The Chimes were painstakingly developed in the Lowrey laboratories and carefully checked against the voices of actual chimes. To create the Chimes—pull the "Chimes-Effects" knob at the right of the Upper Manual, turn the Manual Sustain tabs "On" and in the "Long" position, and put on any of the Upper 8′, 4′ or 2′ voices. You now have 18 notes of chimes on the Upper Manual—from C an octave above Middle C to the top F as indicated by the gold line on the black channel. Remember, you can still play conventional organ on the lower section of the Upper Manual (19 notes), either with arpeggios or sustained chords, creating an interesting "three-manual" organ effect. When playing the keys for Chimes, do not hold the key but strike it in a very staccato fashion. Only a few of the multiple uses of the Chimes are suggested below.

If you have a combination of Flute 8′, Trumpet 8′ and Flute 4′ (with the "Long" Sustain and the "Chimes-Effects" knob out), a large full chime or "Carillon" will be heard. For a smaller and more brilliant chime, use just the Flute 4′. To create the delightful sound of little "Swiss-Bells," try the Piccolo 2′. Also, for a beautiful "Harp" accompaniment with the Chimes, use the 8′ and 4′ Flutes and "roll" the chords on the lower section of the Upper Manual (19 notes), or couple the 8′ and 4′ Flutes down to the Lower Manual (Upper to Lower 8′-4′-2′), and you will have a full Harp of 44 notes for arpeggios. Thus, with your Lowrey Heritage you can produce sounds which the world has never heard before.

Stop tabs and what they mean

Lowrey Voices • Upper Manual

flute 16′ (flute family)

A basic stop having a deep mellow tone of the pure flute family. Pitched one octave below the Flute 8′, its clear, singing, and reposeful qualities make it ideal for a flute ensemble, diapason chorus—and in every direction in which it may be employed.

trombone 16′ (reed family)

Principally, the function of this stop is similar to that of the bass trombone in an orchestra. The tone of the Trombone 16′ is smooth, poetical, and full of beauty. In the lower register it is dark and liquid—brilliant and triumphant in the high compass. To simulate the orchestral instrument, use a Vibrato setting of Slow-Heavy with the occasional use of the exclusive Lowrey Glide. An unusual voice can be obtained with the Quint 5⅓′ in any vibrato setting to suit the music.

cello 16′ (string family)

This is truly an orchestral stop. It has been carefully voiced clear, singing, and reposeful with the proper harmonics so that it has all the richness, resonance, and liquid tones of the orchestral instrument for which it has been named. Depending upon the selection played, either the Slow-Light or Slow-Heavy Vibrato should be used. The voice is typically cello in the lower range of the manual—in the upper range of the manual it has an excellent viole quality. For many organ selections it has an excellent foundation quality making it valuable in every direction in which it may be employed.

flute 8′ (flute family)

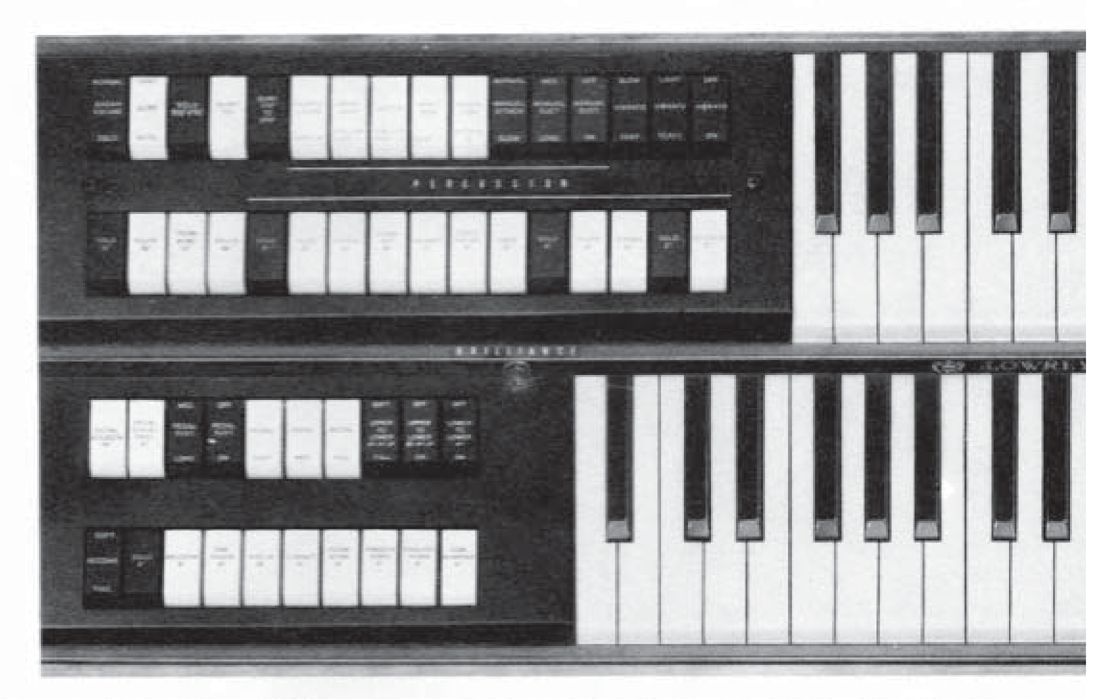
This stop is a companion to the Flute 16′ but plays one octave higher. Of all the stops of the organ, the flutes lend themselves most readily and efficiently to effective registration, combining perfectly with the stops of every other tonality.

string 8′ (string family)

This is a foundation stop which is appreciated by the pipe organist because of its delicate, silvery, singing quality. When played without a vibrato you will hear the rich harmonics of a fine pipe organ. With the Fast-Heavy Vibrato in the upper register, it closely resembles the fullness of an orchestral violin. By playing in the lower portion of the keyboard a viole effect can be obtained with the use of the Slow-Heavy Vibrato. In combination with other stops, this string tone adds a richness and brilliance to the tone quality.

clarinet 8′ (reed family)

This is an excellent solo stop. No other organ has such a fine clarinet. When played without vibrato, it closely resembles the orchestral clarinet because it has a smooth, hollow, reed tone of great beauty. It not only possesses this richness of the orchestral clarinet, but in the middle portion of the keyboard it is superior to the orchestral instrument, because it is less shrill. The classical music lover will prefer this



voice with the "Slow" Manual Attack for a "lip" action. When combined with the Quint 5⅓′, many unusual and "oriental" effects can be obtained. For related effects, it is desirable to also add the trumpet or string voices.

trumpet 8′ (reed family)

A bright silvery voice with just sufficient brassiness to give it true character. When played as a solo in the middle register of the keyboard with a Slow-Heavy Vibrato, this stop to some extent produces the effect of an orchestral trumpet. Quite often, it is used to combine with other stops to give a brilliance to the music being played. In such cases the addition of a Fast-Heavy Vibrato for popular music is most desirable.

saxophone 8′ (reed family)

Here is a lovely voice for ballads and romantic selections—soft and penetrating in the higher octaves, full and rich in the lower octaves. It does not appear on many organs because it is a difficult sound to create. However, the Lowrey Heritage being an unusually fine organ, it can closely reproduce the sounds of the saxophone by the addition of a Fast-Heavy or Fast-Light Vibrato and the occasional use of the exclusive Lowrey Glide.

oboe 8′ (reed family)

A melodial voice, having a pastoral character, full of tenderness. It is an excellent solo stop, closely resembling the plaintive voice of the orchestral instrument. For those who know the orchestral instrument, we merely mention that this stop has a greater range. A fascinating and haunting quality can be obtained by adding the Clarinet and the Quint 5⅓′. In such case, the effect is created with or without vibrato and may be played throughout the entire keyboard.

flute 4′ (flute family)

This stop is typical of the Lowrey's clear, clean flutes and is the "little brother" of the 8′ and 16′ Flutes previously discussed. It plays one octave higher than the 8′ Flute and two octaves higher than the 16′ Flute. When you play arpeggios without vibrato, your result will be celeste and bell-like tones; you will also notice a brightness and keen quality when you combine this with other stops. When the Flute 4′ is played with the Long Sustain and combined with the 16′ Flute, it creates an "echo chamber" effect.

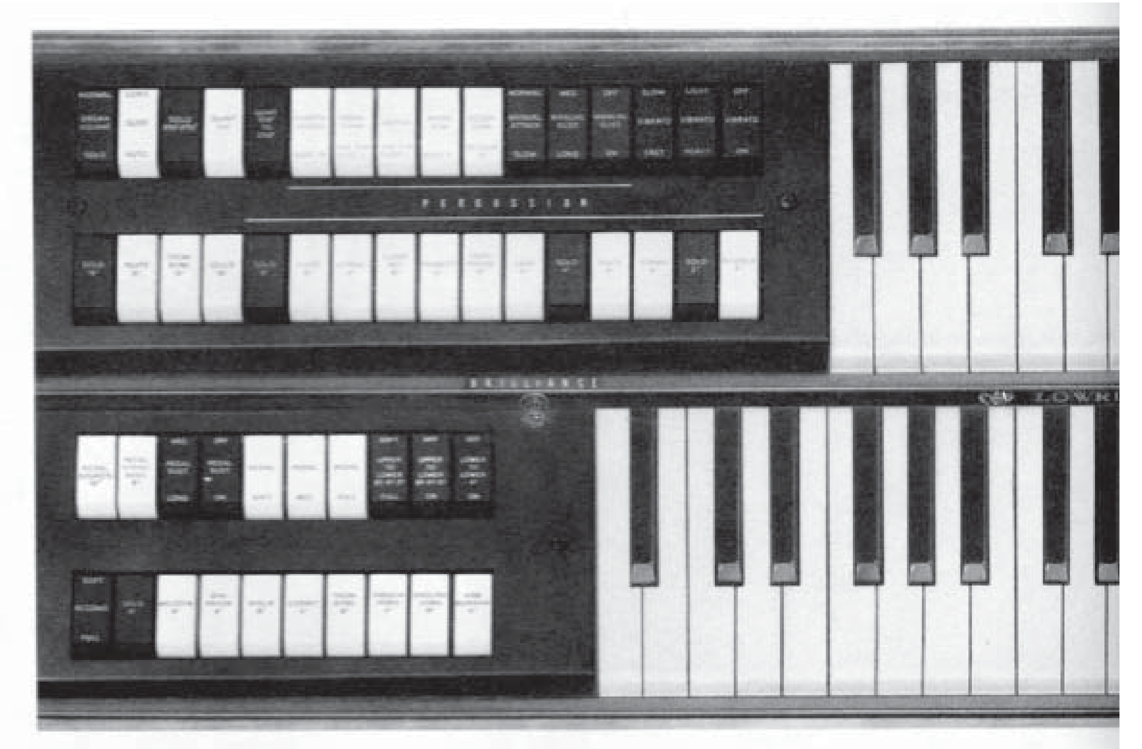
string 4′ (string family)

This is the companion of the String 8′ and plays one octave higher. When played as a solo with the Fast-Heavy Vibrato, it closely resembles the "Gypsy" or orchestral violin in a higher register. When combined with other stops, it adds a rich, "biting" quality, very brilliant in nature. It is absolutely essential for many types of organ music.

piccolo 2′ (flute family)

This brilliant flute stop is pitched two octaves above the Flute 8′. The duty of the Piccolo 2′ is, principally, to extend the range of the 8′ and 4′ flutes in the high register. Its beauty of tone and clarity of pitch

Stop tabs and what they mean



give it wide use in any register on the keyboard. The "whistling," piercing quality of the Piccolo 2′ in its highest compass is extraordinarily powerful, making it of extreme value in both solo-work and artistic registration.

quint $5\frac{1}{3}'$ (flute family)

This stop should never be played alone. The reason is that it produces a tone a "fifth" above the key which is pressed. In other words, when you press a "C" only the "G" will be heard—if you press a "D" only the "A" will be heard. The stop is a "must" on all fine organs because in combination with other stops, it adds a richness called "tone coloring." In combination with the Oboe, Clarinet, Trombone and other stops (played without vibrato) it lends an "Oriental" atmosphere to any melody. Continued experimentation with this stop will determine its best uses.

quint $5\frac{1}{3}'$ to $2\frac{2}{3}'$

This stop cannot be played alone. The reason is that it is a Coupler with respect to the Quint $5\frac{1}{3}'$. With the Quint $5\frac{1}{3}'$, when you press a "C" only the "G" is heard—with the $2\frac{2}{3}'$ Coupler when you press a "C," the "G" *an octave above* will be heard. When the Coupler $2\frac{2}{3}'$ is used in combination with Quint and other stops, provided Quint $5\frac{1}{3}'$ tab is "On," it reinforces the upper harmonics and provides additional color and brilliance. The Coupler $2\frac{2}{3}'$ and Quint $5\frac{1}{3}'$ are invaluable in building-up and delicately tinting other distinctive voices.

Lowrey Voices • Lower Manual

melodia 8′ (flute family)

A beautiful flute-tone organ stop with a smooth, singing quality. To maintain the real beauty of tone, it has been carefully voiced so as not to be over-powering. When arpeggios are played in the upper register, it has a lovely "bell-like" quality which makes a delicate accompaniment for the String and Clarinet voices on the Upper Manual.

diapason 8′ (diapason family)

The Diapason's tone has always been, and always will be, the unique and special glory of the organ. It has a full, round, and dignified tone giving a foundation on which to build compound tones of surpassing grandeur and beauty.

viola 8′ (string family)

The full and rich tones of the Viola 8′ will impart strength and color to every combination that it is used with—creating valuable tonal colorings in registration in which brightness is desired without a cutting quality.

cornet 8′ (reed family)

This voice has powerful and dominating tones and will become the delight of the organist in his registrations, forming with stops of all tonalities—combinations of rare beauty and charm.



trombone 8′ (reed family)

This stop has the same "liquid" tones as the Trombone 16′ on the Upper Manual, but it sounds one octave higher. When played alone on the Lower Manual, it offers the ideal accompaniment for the Trombone 16′. In combination with other stops, it adds a resonance or "body" to the voicing.

french horn 8′ (reed family)

This stop can be used with the Solo 8′ to play either melody or counter-melody on the Lower Manual. Without a vibrato it closely resembles the orchestral instrument. It has been made a "must" on all Lowrey Organs since, in recent years, the French Horn has become a very important voice on many expensive organs. It should be used frequently as the accompaniment for softer voices and combinations on the Upper Manual.

english horn 8′ (reed family)

A beautiful solo stop and valuable in artistic registration, producing in combination with softly-voiced stops of contrasting and harmonic-corroborating qualities compound voices of remarkable tonalities.

vox humana 8′ (reed family)

This stop requires the aid of the Vibrato in a Fast-Heavy setting imparting a distinctive coloring to soft combinations of contrasting tonalities. Played alone in full chords, its tones are rich and beautiful.

Lowrey Voices • Pedals

bourdon 16′ (flute family)

A basic stop of 16′ pitch having a deep rich tone of the pure flute family. It provides an ideal foundation for solo or accompaniment playing—and because of its character and voicing, it has an amazing carrying power without being loud or overpowering.

string bass 8′ (flute family)

A colorful stop voiced with the foundational characteristics of the flute as well as the richness of the string. This beauty of voicing gives the clear, resonant tones of the "string bass" section of an orchestra—providing the depth and foundation to the music you play. For a "bull-fiddle" effect, add the Pedal Sustain in the "Medium" position and play the pedals with a light, quick touch in the upper octave.

Either of these 16′ and 8′ pitches can be used individually or in combination on the 13′ note pedal keyboard of your Lowrey Heritage. The judgment is left entirely to the discretion of the player, based upon his style and the music.

In addition, there are four settings of pedal intensity—very soft, soft, medium, and full. (The three white tabs, located in the lower group of controls.) This versatile arrangement offers the equivalent of 12 individual pedal stops to balance properly to any combination of manual keyboard voices. A complete description of these tabs is discussed on page 15.

Mechanical stops

vibrato

This interesting and appealing variation is controlled by the three black tabs at the right end of the second row of controls. They create the wavering effect which you notice most in the violin, the cello and other string instruments. Listen to a singer and you will hear the same vibrato. However, the "speed" of the vibrato (wavers per second) varies with the instrument or voice. So does the "depth" which is the extent of the vibrato above or below the accurate pitch. Some instruments have a great deal of vibrato —others have very little—some have none.

With the right hand vibrato tab in the "Off" position, it makes no difference what is "set up" on the other two. The tone will resemble that of a pipe organ which obviously adapts music played in this way to many religious selections as well as some classical music. (However, since music is an expression of a composer's or musician's feelings, there is no positive rule for the use of vibrato.)

Here is the first effect. With the three vibrato tabs off, hold a tone. Then turn the right hand tab to the "On" position. You are now using a "Slow-Light" Vibrato which is ideal for offertories and voluntaries in church music and is used frequently for operatic, light classical, and some ballad selections.

Second, (holding the same tone) move the left-hand tab from Slow to Fast. Now you have a "Fast-Light" Vibrato which can be used for almost any type of music.

For a third vibrato, move the center tab from Light to Heavy. Now, all three tabs are in the "on" position so you have a "Fast-Heavy" Vibrato. This is used to a great extent for ballad and popular music. The string voices sound unusually rich and full when this vibrato is used. Unusual "Theater Organ" effects can be obtained when using the flute stops.

For the fourth vibrato combination, move the left hand tab to the Slow position. This Slow-Heavy combination is used less frequently than any of the others but it does have a desirability for Trombone, Trumpet and for solo Cello and Hawaiian effects. This unusual vibrato is applied differently by different musicians.

Note that this simple tab arrangement will permit you to vary your music frequently while you play. Sometimes you will use a particular vibrato for only a few measures—or, by just turning the righthand tab to Off, you suddenly have no vibrato and after playing four or eight measures, you can easily go back to the previous vibrato.

In summary then, change the vibratos frequently and you will never have the feeling that your music is becoming monotonous. This is the "seasoning" which you can add to make your music just that much more delightful.

solo 16′, 8′, 4′, 2′, 5⅓′, 2⅔′

These six Solo tabs are another feature originated and developed by Lowrey engineers which will make you both happy and proud that you have selected a Lowrey Heritage. They produce no sound in themselves but they are probably the most valuable tabs at your finger tips, because they greatly multiply the number of voice combinations from your Lowrey Heritage.

The Solo 8′ on the Lower Manual increases the volume of any or all of the eight Lower Manual voices. For example, you may find that a solo melody of single notes in the left hand (or just staccato chords) may not be loud enough. Without adding more voices but just turning on the Solo tabs, the volume of the notes played on the Lower Manual will increase and offer the proper contrast to the voices on the Upper Manual.

Generally, voice combinations are set up for the Upper Manual without any of the Solo tabs. Try this by setting up the six flute voices of 16′, 8′, 4′, 2′, Quint 5⅓′ and Coupler 2⅔′. Now, if you wish to emphasize the lower register of this combination, turn on the 16′ Solo. By the same token, the 8′ Solo brings out the middle range and the 4′ and 2′ Solos emphasize the higher ranges. The "coloring" quality of the Quint 5⅓′ and Coupler 2⅔′ are accentuated by the use of their solo tabs. In other words, these five solos *double* the number of Upper Manual voices.

Each of the voices is an accompaniment or "soft" stop—by applying a Solo tab, you make them a solo or "loud" stop.

Remember, if a selection is played on both manuals and you feel that the volume intensity of one manual should be increased, there is no need to add more voices as you would have to do on other instruments. Merely turn on a Solo tab or two of your choice and you suddenly lift the melody so it stands out just like a solo instrument in an orchestra.

When Solo tabs are not used in either manual you have thousands of tonal combinations which, like other organs, can be arrived at purely by the use of the voice tabs. However, by adding the various "Solos," you bring into play many *additional* combinations which will make your music just that much more enjoyable and interesting. No other comparable instrument offers you this "Solo" method of easily and simply selecting so many additional tonal combinations.

coupler—upper to lower 8′-4′-2′

The red tabs in the bottom group of controls will "couple" any combination of 8′, 4′ and 2′ Upper Manual voices to the Lower Manual. These tabs are colored red to show you that they are associated with all the solid red tabs above as well as with the white tabs printed in red. Turn on any of the red tabs for the Upper Manual—then, holding a key on the Lower Manual, turn on the right-hand "coupler." You will notice that you get the same voice and effect of the Upper Manual but it is softer. This is because the left-hand tab is in the "Soft" position. When you change the left-hand tab to the "Loud" position, you will have the same result and volume as you do from the identical key above.

Only a few of the multiple uses for these tabs are suggested below. You might wish to accompany the Accordion voice on the Upper Manual with the same voice on the Lower Manual with the "Soft" coupler. This would also be true of the Vibraharp and Guitar. In the case of the Harpsichord and Music Box, you probably will wish to couple the voice to the Lower Manual using the "Loud" position.

If you have a combination of 16′, 8′, 4′, 2′, Quint 5⅓′ and Coupler 2⅔′ voices with Sustain on the Upper Manual, you can couple down only the 8′, 4′, and 2′ voices to the Lower Manual for a complete sustain effect below. Also, just as you are able to get a combination of staccato and sustain voices on the Upper Manual, so you can get the same effect on the Lower Manual. For example, using a sustained Vibraharp and 16′ Flute on the Upper Manual and coupled "Soft" to the Lower Manual, add the Solo 8′ and Melodia to the Lower Manual. You now have a registration which will permit staccato chords on the Lower Manual with some "reverberation" coming from the Upper Manual.

The setting of these two tabs will depend to a great extent on the volume from the Upper Manual and the technique in playing each manual. Your own judgment will guide you after you have had some experience with these new tabs. Remember, the "couplers" do not couple down any of the 16′, Quint 5⅓′ or Coupler 2⅔′ voices.

coupler—lower to lower 4′

This black tab speaks only when a lower manual 8′ voice is turned on. This introduces an octave higher (4′) of the particular voice being played.

coupler—quint 5⅓′ to 2⅔′

This black tab speaks only when the Quint 5⅓′ voice is turned on. This introduces an octave higher pitch in addition to the Quint 5⅓′ being played.

organ volume

Although your Lowrey Heritage Organ is a spinet in size, it has a great deal more versatility to offer than organs which cost much, much more! In many re-

Mechanical stops

spects your Lowrey is like a pipe organ since the volume keeps building as voice after voice is added to the manuals. Therefore, it has been equipped with this stop to govern the overall volume of the entire instrument including both manuals and pedals.

When you play with just one or a few stops, you will prefer to have this control in the Solo position. When you use many tabs on both manuals (which requires increasing the pedal volume as well), you will undoubtedly prefer to place this control in the Normal position. With just a moderate amount of stops for both manuals and pedals, the control can be in either position as your judgment dictates.

Remember just one thing. This is an *overall* volume control so when you feel the output of the organ is too loud or distorted, place it in the Normal position. When you play with just a few voices, you will then wish to place it in the Solo position.

accompaniment (accomp) — soft, full

This is an outstanding Lowrey feature which gives you complete control of the volume of the Lower Manual. (The black tab located to the left in the bottom row of tabs.) You now have three volume intensities for the voices on the Lower Manual. For example: turn "on" Melodia 8′ and play a chord—now add Accomp "Full"—finally the Solo 8′ tab. This makes it possible for the exact volume of the Lower Manual voices to balance properly to any combination of Upper Manual voices.

manual sustain

The two red tabs in the upper row of stops control the 8′, 4′ and 2′ and preset voices of the Upper Manual. For your convenience, this section is marked "percussion"; the voice tabs are printed in red and the mechanical Solo stops are solid red. Turning both of the sustain tabs on will cause the 8′, 4′ and 2′ Upper Manual voices to sustain over a period of about two seconds after a key is released. By turning the left hand tab to Medium, there is a sustain which lasts about one second. These two tabs can create many different instrumental effects which will be described later. However, the wide scope of this manual sustain does not stop here.

Reverberation of a most authentic nature can be obtained with your new Lowrey Heritage. Use any selection of 16′, 8′, 4′ and 2′ stops and play something in the conventional organ manner. As with any organ if acoustics are poor (due to smallness of the room, carpeting, draperies, and other factors which deaden sound) the resulting organ tone will seem suppressed and restricted in its tonal quality. Then, introduce the "Medium" Manual Sustain and later the "Long" Sustain. You will notice that the walls of the room seem to "disappear" because you have added a natural reverberation which normally could come only from a *large* vaulted chamber or auditorium with hard floors, walls and ceiling where the sound would echo and so improve the tones produced. Your new Lowrey will sound beautiful no matter how small or acoustically "dead" the room may be.

manual attack

With the tab in the "off" position, the attack of the 8′, 4′ and 2′ voices is "normal." Move the Manual Attack tab to the "Slow" position and you will notice that the tones are somewhat delayed as they would be on an accordion or a pipe organ.

This desirable arrangement permits you to change the character of your music from one extreme to the other with just the flip of a single tab.

Thus, your Lowrey gives you the choice of two different kinds of manual attack. For example, play the Clarinet voice without vibrato. With the Attack tab in the "slow" position, the Clarinet will have the soft attack of the French instrument. When the tab is turned "off," the brilliant attack is at your command. Use these various attacks to make your music more interesting, more versatile and more enjoyable.

pedal—soft, medium, full

These are the three white tabs in the lower group of controls marked "Pedal," and they control the volume of the thirteen "keys" played with the feet. With the three white tabs in the "off" position, place the Bourdon 16′ in the "on" position, then hold a pedal key and place the expression pedal about half way. This is a "very-soft" pedal position, sufficient for the soft voices such as the String 4′ or Oboe 8′ on the Upper Manual, and the Vox Humana 8′ or English Horn 8′ on the Lower Manual. Now, still holding the pedal key with your left foot and without moving the expression pedal, turn on the Soft, Medium and Full tabs in that order. Here you have three additional degrees of volume or "pedal intensity." You will find this wide range of four pedal volumes helpful in matching any stop registration you select.

For soft classical or liturgical music where there is no definite rhythm, the pedal setting should probably be soft. With a rhythm tune like a waltz or a popular song, you may wish to use the Medium intensity and as you add voices to both manuals and increase the volume from the keyboards, you will probably then wish to use a Full pedal volume.

As you play different selections you will sense the necessity for more or less pedal volume and will soon become accustomed to making the various changes.

pedal sustain—medium, long

This is an outstanding Lowrey feature, welcomed by the professional and absolutely essential for proper pedal control by the less experienced. With these two tabs in the "off" position, press a pedal key several times. The effect is similar to that of most electronic organs since they do not have a "Pedal Sustain." Now with these tabs in the "on" position, press a pedal again. After releasing the key, the pedal tone reverberates and sustains in about four or five seconds. It resembles a pipe organ tone in a large cathedral or amphitheater, or the resonance of a bass voil. Thus, you can lift your foot from one key and the sound will continue for several seconds, giving you time to press the next key. You can even get a "pedal legato" when you play from "C" to "G"—or any other keys which are widely separated on the pedalboard.

Note that this has been engineered so that the first pedal note is cancelled the instant you play the second note.

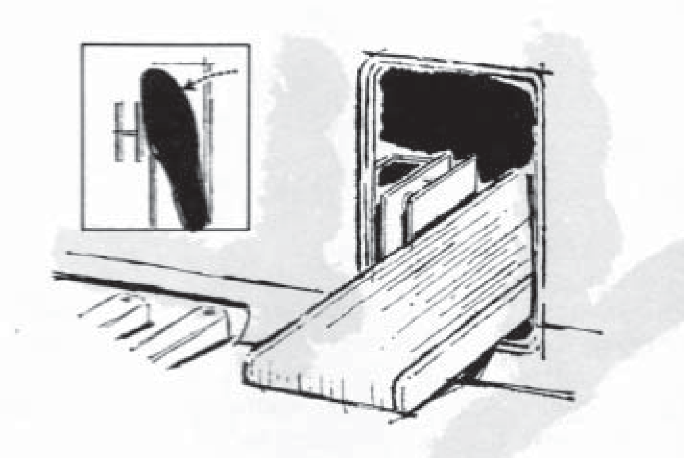
The Long Pedal Sustain may be too long for certain types of music when less sustain is desired. For that reason, Lowrey engineers have developed the Medium Sustain, used by turning the right-hand tab to the "off" or "med." position. The use of this exclusive Lowrey feature is dependent upon the music and the way you play it. Therefore, as you play different selections, experiment with these three settings until you are familiar with their many uses.

This Pedal Sustain, developed by Lowrey engineers, is most desirable not only because it closely approximates the results associated with a pipe organ, but because it also offers a marvelous "assist" to the relatively inexperienced organist.



"Fun With The Lowrey Organ" in your Heritage Owners Envelope is arranged to acquaint you with the magnificent solo voices of the organ such as clarinet, strings, trombone, oboe—the reverent church qualities which are inherent in every Lowrey organ—a number of the amazing percussion effects: guitar, vibraharp, harpsichord, banjo—and of course, the unusual special effects that are available only on your Heritage.

In addition to "Fun With The Lowrey Organ," suggested registrations are shown on the following pages with selections from the Lowrey Minit-Music to help you create many other beautiful tones and special combinations for your favorite ballads, hits of the day, hymns and the timeless classics.



Lowrey Glide Control

There are many reasons why your Lowrey is such a superior instrument. If you have carefully read the previous portions of this book, you are now aware of those many advantages. Once you feel you have obtained some familiarity with your new instrument, you are ready to move into the use of the *exclusive* Lowrey Glide Control.

Musicians everywhere—amateur, artist, and professional—all say that the exclusive Lowrey Glide Control is the greatest organ development in recent years. Some organists are not even aware that it is available; and not many realize the wonderful way in which it enhances the orchestral voices of the trombone, clarinet, trumpet, strings, flutes, etc.

The white tab marked "Glide" at the left end in the top group of controls, governs the Glide Control on the left side of the Expression or "swell" pedal. When you have the Glide tab in the "Cont." position, or "controlled" position, you can push the Glide Control to the left with the inside of the right foot and the entire instrument will "flat" about a semitone. (Also, the vibrato will stop completely.) As long as you hold the control to the left, it will stay that way because you "control" it. When the Glide Control is released by the foot, the tones will "glide" back to normal pitch and vibrato as determined by the stop tabs. Now, turn the tab to the "Auto." position, which means that the return to normal pitch and vibrato will be automatic. Hold a tone on the manuals and press the Glide Control, holding it to the left. You will notice that the tone will "glide" instantly to the proper pitch and vibrato and return without your having to release the control.

For the best playing technique, the Glide Control should be pressed with the foot at the *exact instant* certain keyboard notes are played—and then released at once. For example, start using the Glide Control by trying it with the Trombone 16′ and a Slow Heavy Vibrato. Play Tommy Dorsey's familiar "I'm Getting Sentimental Over You" with "glide," and you'll be able to duplicate that well-known trombone "smear." No other organ can do this!

Also, you can get a realistic string "glissando" by using the Lowrey Glide Control together with the String 8′ of the Swell Manual, and the Fast-Heavy Vibrato. Try Victor Herbert's beautiful "Sympathy," or any other of your favorite violin selections. The Glide Control will supply the "glissando" of the strings. Adding the Manual Sustain will give the effect of "singing strings."

For Hawaiian guitar effects, you can use the Clarinet 8′ with a Slow-Heavy Vibrato, the Flutes 8′ or 4′ with a Fast Heavy Vibrato, or a combination of any of these tabs, with any Hawaiian selection of your choice. Be sure to use the Long Manual Sustain and play in a semi-staccato fashion. Press the "glide" the instant you strike a key. However, use it infrequently—do not abuse it by playing most notes with glide. The realism of this Hawaiian Guitar effect will amaze you.

Like anything new, a few minutes of practice are necessary for you to become adept with the Lowrey Glide Control. As time goes by, however, you will find more and more uses for it. Of course, your ability to use it will also improve. To quickly improve your use of the glide, listen carefully to records, radio and television. Pay particular attention to the way musicians play their various instruments.

Also, whenever you try these different effects with Glide Control, be sure to remember that it is important to select the correct vibrato. Making sure of this is just as important as selecting the proper individual voice tabs on the manual.

The care of your Lowrey

console and bench

The finest woods, both solid and veneer, have been used so that the cabinet will retain its beauty—and its appearance will improve over the years. It has been hand-rubbed to give you a highly finished piece of furniture. A soft, clean, dry cloth cannot be surpassed for dusting. To remove fingerprints or dulling film use a soft cloth slightly dampened with water and a little mild soap. Immediately wipe dry with a soft cloth.

keys and stop tabs

To remove stickiness or greasiness which may have accumulated, use a clean soft cloth dampened in water and a little mild soap. Do not use any solvents thinners or dryers such as alcohol, gasoline, lighter fluid, carbon tetrachloride, etc. They may attack either or both the lettering and the finish on the tabs and keyboards.

foot pedals

These can be cleaned with a damp cloth and mild soap solution as recommended above.

sun, heat and cold

Here is a final word about the care of the Console. Do not place it where the sunlight will be directed on the cabinet. In time, as with any piece of fine furniture, the sun will bleach the finish. Also, heat from the sun can damage the finish. If the instrument is placed near a window which is opened in winter, sudden blasts of cold air on a cabinet at room temperature can cause damage. Placing the cabinet next to a radiator or hot air register is also undesirable. Heavy objects should not be left standing on the top of the case since in time they can mar the finish.

moving the Lowrey organ

There is no need for bolting or fastening any internal part of the Lowrey when moving. Merely be sure that all screws which hold the back in position are securely fastened. Careful consultation with your mover will assure you of a satisfactory moving job without damage.

check list

If your Lowrey organ becomes inoperative or does not function properly, first follow this simple step-by-step Check List before calling for service.

1. Make certain that the line cord is plugged into *live* AC outlet. Make sure the wall receptacle is not faulty. Hum from the speaker may be reduced by reversing the line-cord plug in the wall outlet.
2. Be sure the "Off-On" switch is on. Pilot light will indicate, but as these occasionally burn out, check back of console to see if any tubes are lighted.
3. FUSE: There is one fuse for the entire organ. If pilot light and none of the tubes are lighted, check for blown fuse on the Amplifier-Power Supply chassis.

   Fuse is easily removed. Turn red insert counter-clockwise with screw driver until it comes out. The fuse can then be pulled from the insert and a new one installed.

Caution: Use only 3.2-Amp "Slow-blo," Type 3 AG fuse

4. At least one white voice tab must be "on" before a manual will play.
5. The Swell Pedal must be depressed to bring up volume.
6. If all of the above have been checked and operation is still not normal (and you are sure all the tubes are in tight), there may be a faulty tube. Read the following pages which contain information on tube replacement or call your dealer for service.
7. The name plate containing model and serial number of your Lowrey organ is located on the rear of the cabinet near the bottom. Include model and serial number in any correspondence.

A competent service technician should be consulted if difficulties persist. Your Lowrey dealer is best qualified to handle this, although any good radio-television technician should be able to handle necessary repairs. Schematic diagrams will be furnished to owners upon request. Please send check or money order for $2.00 and remember to include the *model and serial number* in any correspondence.

Electrical information

tuning

Because Lowrey's electronic circuits are very stable and the positively locked oscillator system was carefully tuned at the factory, your Lowrey Organ will probably never need to be tuned. However, if a special use requires a change in pitch of the entire organ, such as playing with a piano or other instrument not using the standard A-440 pitch, this can be accomplished in a few minutes with the Lowrey. We recommend that you contact your Lowrey dealer for this service. Do not tune until the organ has been on for about twenty minutes.

3-Position MASTER VOLUME CONTROL located on the Amplifier (see fig. 2) is used to set the volume to suit the room playing conditions (i.e. size, absorption, etc.). To reduce volume turn clockwise.

NEVER PLUG THE ORGAN INTO A DC OUTLET DAMAGE MAY RESULT. The line cord from the rear of the Console MUST BE PLUGGED INTO STANDARD 110-120 Volt AC LINE. (If the power supplied in your area is other than 110-120 Volt AC, 50-60 cycles, be sure there is a notice on the back of the Console that corresponds to your special power requirements.) Normal voltage fluctuations won't affect your Lowrey, although regulation by your electrician may be required if voltage goes above 125 or below 100 volts.

The "OFF-ON" switch is located to the right of the lower keyboard. The near-by pilot light indicates when the organ is "On." In extremely humid areas a special heater may be installed to protect against dampness. In order for this heater to operate, *keep the line cord plugged into the wall outlet at all times*—very little electricity is consumed. If you move to a humid climate, ask your local Lowrey dealer to install one of the special heaters in your Lowrey.

AUXILIARY SPEAKER terminals are provided in the amplifier power-supply chassis at the rear of the organ. Remove the back and you will see this chassis just above the rear of the pedal keys. These terminals are wired across the output transformer, 16 ohm secondary. It is used for adding an external speaker—or another amplifier which in turn can drive an additional speaker or speakers. Impedance matching is not critical for normal use because additional distortion will not result except at higher output levels.

The power amplifier consists of two push-pull 7591 tubes—Maximum signal power output—30 watts. Two 12" PM heavy duty speakers with combined voice coil impedance of 16 ohms are wired in parallel to match the secondary 16 ohm impedance of the output transformer. In addition a heavy duty mid-range driver with appropriate crossover network is used to isolate the highs and lows for best acoustical results.

Tube replacement

Past experience has shown us that although many purchasers of Lowrey Organs have no technical understanding of the vast field of electronics, they are able to replace a defective tube. So, this material has been prepared for those who know something of the subject.

There are only eight different types of tubes in the entire Lowrey Heritage Organ. Since, in general, they are standard radio and television tubes in common use every day, replacements can usually be purchased at your Lowrey dealer's or at any radio or TV repair shop.

tone generators

After removing the back of the organ you will see a large chassis containing the 49 tone generator tubes. (See Figure 2) This chassis is divided into twelve sections, each one of which produces the family of tones as indicated by the stamping next to the square metal can. Since, for the purpose of this discussion

these twelve sections are all the same, we will consider only one.

The tube which produces the highest tone for a family of notes is in the V-1 socket closest to the metal can. The next tube in the V-2 socket is locked to it and produces the tone exactly one octave lower. Likewise, the next tube in the V-3 socket is locked to the V-2 tube and produces the tone exactly one octave lower. The tube farthest from the metal can (in the V-4 socket) is locked to the third and produces the lowest tone of the keyboard. Thus, if the tube nearest the can (V-1) becomes faulty, not only the tones produced by it but also the lower octavely related tones will be faulty too.

Here's how to find a faulty generator tube. Turn on the Flute 8′, the Melodia 8′ and the Swell Pedal to full volume. Play all the *lower manual* keys in succession starting at the highest E on the right—proceed downward listening carefully *for the first* defective tone. *Be sure this is the highest defective tone on the manual.* If the tone from the corresponding key on the upper manual is also defective, a generator tube may have failed.

To locate the faulty tube, refer to the keyboard chart (Figure 1) and determine in which of the three groups of keys the highest faulty tone is produced. If it is V-1, the tube is nearest to the metal can in that generator section. V-4 is the farthest from the metal can.

Note: It is impossible to catalogue the many various effects which can result from a "defective" tube. The word "defective" merely indicates no sound at all or some sound other than that which should be obtained. For example, the tone could be off pitch or could even be an octave too high.

For example, let us presume that you have determined the V-2 tube in the G generator to be faulty. To check this, remove this tube and exchange it with the V-2 tube in the adjacent generators of A or F. Because you know the tubes in the A and F sections are operating properly, any of them can be used for testing. Now, all G notes should operate properly but the highest faulty tone will be in the generator section where the previously determined faulty tube has been placed. Remember, all of the tubes in the tone generators (CAUTION: excluding the E generator) are the same except for twelve 6 FH 8 tubes in V-2 position. All others are 6X8 tubes.

Hint: When the sustain tabs are on, sometimes a tube may produce a tone which plays quietly at all times even when no key is depressed. Determine the family of the "leaky" tone and pull out the tubes from this section one at a time, starting with the one *farthest* from the metal can. The first tube which silences the tone when removed, is the one that requires replacement.

You have now learned how to locate a faulty tube anywhere in the group of tubes in the tone generator chassis. If this method does not disclose a faulty tube in the generators, contact your dealer for service.

quality control chassis

Next, let us consider the Quality Control Chassis. This is above the tone generators and to the right as you face the rear of the organ. It contains five (5) tubes arranged in a horizontal row. The five tubes in this chassis have a variety of functions. When one of these fails, substitutions can be made to locate the faulty tube. Several types of faults are covered below to help you find the defective tube.

groups of notes

Depending upon the tabs used, if an entire keyboard does not respond or if a group of consecutive keys produces no tone or a defective tone, the faulty tube in all probability is in the sockets V-49, V-50, V-51, V-53 (12AX7) or V-57 (6X8).

Temporarily substitute a new 12AX7 tube in V-49, V-50, V-51, and V-53 until fault is corrected. The tube last removed is probably defective.

If the 16-foot voices fail to sound in the lowest octave of the upper manual, or if the lowest 8 keys of the lower manual fail to respond, the fault in all probability is V-57 (6X8). Exchange the tubes in V-56 and V-57—if the manuals then operate correctly, the pedal tones may not operate properly and a new 6X8 (V-56) will be required.

Upper Manual Keyboard Chart

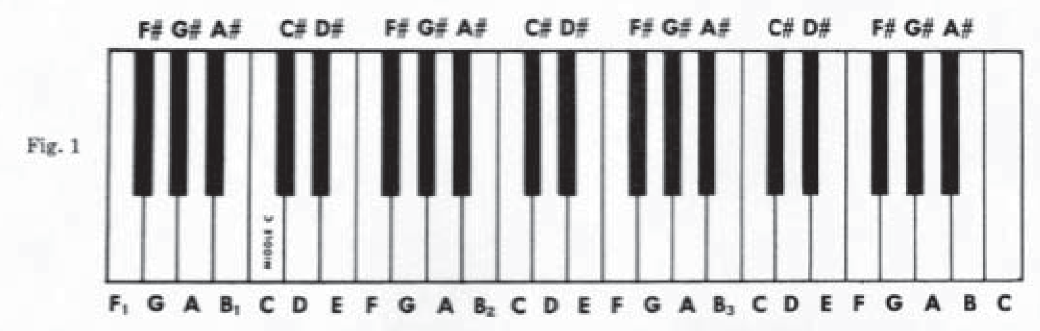


Fig. 1

vibrato

If the vibrato becomes defective on all notes of the organ, the offending tube could be in V-52. V-51 may be exchanged with V-52. Then, the faulty tube in V-51 should produce certain defects on the manuals and should be replaced.

If the vibrato is defective on only ONE FAMILY of tones (all Fs or all Gs) the tube in V-1 of that generator may be faulty. Exchange it with the tube in V-1 of another generator and the faulty vibrato should move to the other family of notes.

pedal keyboard

If the pedal tones lose their volume or become defective, the fault is probably with a tube in V-54, V-55, or V-56.

To check V-55 and V-56, substitute any 6X8 from the main tone generators. If the pedal tones are still defective, the fault may be in the V-54 tube (6EZ8).

noises, dead or weak (all stops)

V-53 tube on the Quality Control chassis is an amplifier for string tones and upper 4′, 2′ and 5⅓′ tones, and also is an amplifier for all manual and pedal tones. Exchange this tube with V-52 and if the manuals play correctly, the tube now in V-52 is probably defective.

amplifier-power supply chassis

The Amplifier-Power Supply sections are incorporated in the tone generator chassis; the tubes for these circuits are V-58, V-59, V-60 and V-61. A defective tube here will affect the entire organ rather than any particular stop, group of keys or a manual.

noises, dead or weak

To check V-58, replace it with a new 12AX7 tube.

V-59 and V-60 are the power output tubes (7591). Since they work together, to test these tubes, a new tube should be tried in each of these sockets.

The 5U4 tube in the V-61 socket is the rectifier and since only one of these is used in the instrument, a test would have to be made with a new tube.

fuses blow

If the fuse blows, in all probability the offending tube is the V-61 rectifier tube. However, there is always the lesser possibility that either 7591 tubes in the V-59 and V-60 sockets could be causing the trouble.

Lowrey DSA model (rear view)

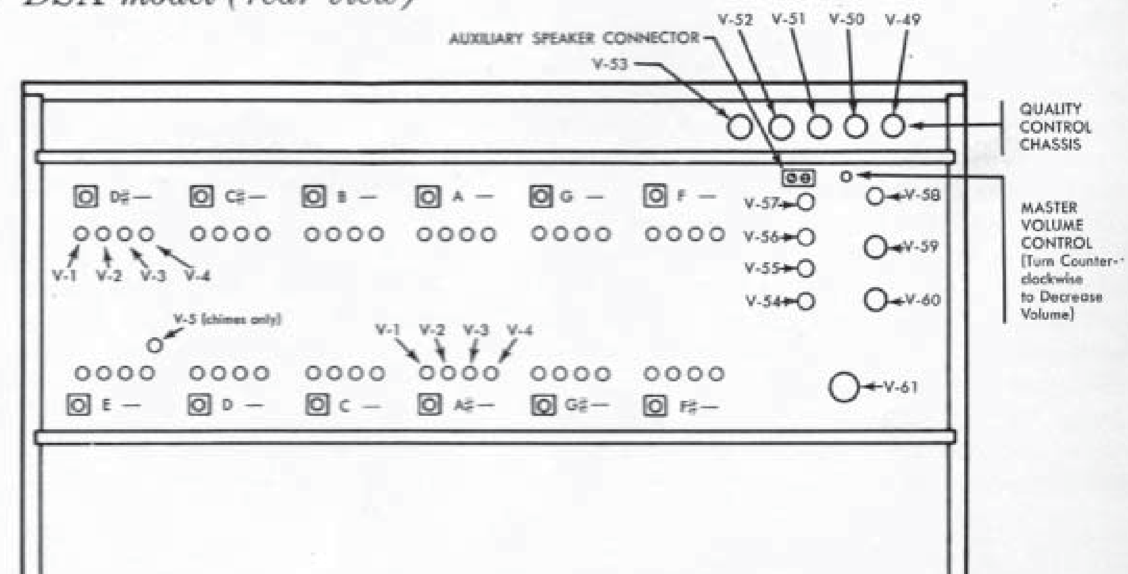


Fig. 2

Guarantee

The Lowrey Organ is guaranteed to be free from defective material and workmanship and the manufacturer agrees to remedy any such defects, or to furnish a new part in exchange for any part of its manufacture which under normal installation, use and service discloses such defect, provided the instrument is delivered by the owner to us or the authorized dealer from whom the instrument was purchased, intact for our examination, with all transportation charges prepaid to our factory, within one year from the date of sale to the original purchaser, and provided such examination discloses in our judgement that it is defective.

This guarantee does not apply to vacuum tubes and the loud-speakers covered by the guarantee of their makers, which is ninety days from date of purchase. We assume no liability under this guarantee if the instrument has been subjected to misuse, neglect, accident, incorrect wiring not our own, or any changes made to the circuits or any part of the instrument, except substitution or resistors and condensers and provided said resistors and condensers are of high quality brand names of manufacturers whose products have been approved by us, and provided further that there has been no improper installation or use of the instrument other than provided for in the instructions accompanying the purchase of the instrument, nor does this guarantee apply to parts which have been repaired outside of our factory, nor to instances where the serial number of the instrument has been removed or defaced, or changed, nor to accessories not of our own manufacture used therewith.

This guarantee is in lieu of all other guarantees expressed or implied, and no representative or person is authorized to assume for us any other liability in connection with the sale of the instrument.

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